



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/777,681	02/07/2001	Kazuo Hakamata	Q61216	3338

7590 01/22/2003

SUGHRUE, MION, ZINN
MACPEAK & SEAS, PLLC
2100 Pennsylvania Avenue, N.W.
Washington, DC 20037-3202

EXAMINER

LEE, SHUN K

ART UNIT	PAPER NUMBER
----------	--------------

2878

DATE MAILED: 01/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/777,681

Applicant(s)

HAKAMATA, KAZUO

Examiner

Shun Lee

Art Unit

2878

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 6/21/02, 8/14/02, & 9/26/02.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 1, 2 and 8 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 3-7 and 9-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 14 August 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 14 August 2002 have been approved. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 9 and 12 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Claims 9 and 12 recite the limitation "wherein the non-imaging region is covered by an opaque film". However, the specification discloses (pg. 32, 12-15) that "The areas forming the non-imaging region 36 other than the fluorescence imaging region 35 are blocked by thin metal films, and the like". Thus while the specification discloses a film which blocks non-imaging regions, there is nothing within the specification which discloses an opaque film which covers the non-imaging region. It should be noted that block is defined as to obstruct whereas cover is

Art Unit: 2878

defined as to overlay or to envelop (see for example, Merriam Webster's Collegiate Dictionary, 10th Edition).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3-5, 10, and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lazarev *et al.* (US 5,986,271) in view of Wilder *et al.* (US 5,262,871).

In regard to claims 3 and 4, Lazarev *et al.* disclose (Fig. 2) a fluorescence imaging apparatus, comprising:

- (a) excitation light irradiating means (16) for irradiating excitation light to a measuring site (51), the excitation light causing the measuring site (51) to produce fluorescence (column 5, lines 1-3),
- (b) imaging means (28) for imaging the fluorescence, which has been produced from the measuring site (51) when the excitation light is irradiated to the measuring site (51), wherein the imaging means (28) is provided with a charge transfer type of image sensor (column 11, lines 45-55), which comprises a plurality of pixels arrayed in two-dimensional directions and which has a fluorescence imaging region (within 30 in Fig. 3) utilized for the imaging of the fluorescence and a non-

imaging region other than the fluorescence imaging region (e.g., other than the fluorescence imaging region within 30 in Fig. 3), and

(c) imaging control means (34) for controlling operations of the imaging means (28).

The fluorescence imaging apparatus of Lazarev *et al.* lacks that the imaging control means controls such that, when signal charges are to be read from the image sensor, signal charges which have been accumulated in pixels falling within the non-imaging are at least one of (a) prevented from being read and (b) read (*i.e.*, quick reading or binning reading). Wilder *et al.* teach (column 6, lines 40-44; column 17, lines 64-66) multiple regions of interest with each region having a resolution that can be independent of other regions of interest and that all pixels can be read or alternatively some pixels are unread (*i.e.*, prevented from being read). Wilder *et al.* further teach (column 18, lines 7-12) that unimportant pixels can be read out as parts of large superpixels (*i.e.*, binning reading) in order minimize the time consumed in reading unimportant pixels. Therefore it would have been obvious to one having ordinary skill in the art that unimportant pixels (e.g., pixels in region other than the fluorescence imaging region) in the fluorescence imaging apparatus of Lazarev *et al.* can be at least one of (a) prevented from being read and (b) read out as parts of large superpixels, in order to minimize the time consumed in reading unimportant pixels as taught by Wilder *et al.*

In regard to claim 5 which is dependent on claim 3 or 4, the fluorescence imaging apparatus of Lazarev *et al.* lacks that the image sensor is provided with a clearing section for clearing signal charges, which have been accumulated in pixels.

Wilder *et al.* also teach (column 17, line 62 to column 18, line 6) a first reading frame

Art Unit: 2878

(i.e., clearing section) where pixel signals are discarded in order to prevent spurious data. Therefore it would have been obvious to one having ordinary skill in the art to provide a clearing section (i.e., first reading frame) in the fluorescence imaging apparatus of Lazarev *et al.*, in order to prevent spurious data as taught by Wilder *et al.*

In regard to claim **10** and **11** which are dependent on claim 3, the fluorescence imaging apparatus of Lazarev *et al.* lacks that the imaging control means stored data indicating which regions of the image sensor corresponds to non-imaging areas (e.g., on a line by line basis) and prevention of reading of signal charges based on the stored data. Wilder *et al.* teach (column 4, lines 45-66) that the readout is controlled with supervisory signals from a processor/computer with predetermined pixel readout instructions (i.e., stored data). Therefore it would have been obvious to one having ordinary skill in the art that control of the readout in the fluorescence imaging apparatus of Lazarev *et al.* occurs via predetermined pixel readout instructions as taught by Wilder *et al.*

6. Claims 6, 7, 9, and 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lazarev *et al.* (US 5,986,271) in view of Wilder *et al.* (US 5,262,871) as applied to claims 3-5 above, and further in view of Talmi *et al.* (US 5,821,547).

In regard to claim **6** (which is dependent on claim 3 or 4) and claim **7** (which is dependent on claim 5), the modified fluorescence imaging apparatus of Lazarev *et al.* lacks that the image sensor is provided with horizontal shifting means, from which the signal charges are read in one direction, the imaging control means controls such that the signal charges having been accumulated in the pixels are transferred to the

Art Unit: 2878

horizontal shifting means and are then read from the horizontal shifting means, and the fluorescence imaging region is located at a position shifted from a center position on an imaging surface of the image sensor toward a side corresponding to a read-out side of the horizontal shifting means. Lazarev *et al.* also disclose (Fig. 3) that an fluorescence imaging region (e.g., 30) is located at a position shifted from a center position on an imaging surface of the image sensor (28). Talmi *et al.* teaches (column 4, line 58 to column 5, line 3) a horizontal shifting means (*i.e.*, shielded portion) such that the signal charges having been accumulated in the pixels are transferred to the horizontal shifting means in order to increase the signal to noise (column 5, lines 21-40). Therefore it would have been obvious to one having ordinary skill in the art to provide a horizontal shifting means for the off-centered fluorescence imaging region (30) in the fluorescence imaging apparatus of Lazarev *et al.*, in order to increase the signal to noise as taught by Talmi *et al.*

In regard to claim 9 (which is dependent on claim 3) and claim 12 (which is dependent on claim 6), the modified fluorescence imaging apparatus of Lazarev *et al.* lacks that the non-imaging region is covered by an opaque film. Talmi *et al.* teaches (column 1, lines 34 and 35) light shielded dark reference rows and columns surround the active area. Therefore it would have been obvious to one having ordinary skill in the art to provide an opaque film for the non-imaging region in the fluorescence imaging apparatus of Lazarev *et al.*, in order to provide dark reference rows and columns as taught by Talmi *et al.*

In regard to claim **13** and **14** which are dependent on claim 6, *Wilder et al.* is applied as in claims 10 and 11 above.

Response to Arguments

7. Applicant's arguments filed 14 August 2002 have been fully considered but they are not persuasive.

Applicant argues (last paragraph on pg. 8 of remarks filed 14 August 2002) that Lazarev *et al.* do not suggest an imaging area and a non-imaging area since all imaged areas are picked up in order to discern fluorescence information from a background. Examiner respectfully disagrees. Lazarev *et al.* state (column 1, lines 43-48) that "The invention features an imaging system which provides an illuminated image of an object that has been subjected to a fluorescent dye, as well as a fluorescence image of the object. Thus, highlighted fluorescent portions of the object are viewed in context with the surrounding environment of the object being viewed", (column 2, lines 1-3) that "A first and a second image sensor are used to receive the illuminated and fluorescence images, respectively" and (column 2, lines 38-41) that "The second image sensor described above has a first region which receives the fluorescence light in the first wavelength range and a second region which receives the fluorescence light in the second wavelength range". Thus Lazarev *et al.* explicitly teach a region (*i.e.*, imaging area) on a second image sensor which obtains fluorescence information. It is important to recognize that it is the first image sensor which obtains the background (*i.e.*, illuminated image) so that the fluorescence image can be viewed in the context of the illuminated image. Further, Lazarev *et al.* state (column 1, lines 43-48) that "Each of the laterally spaced images are passed through respective ones of filters 30, 32 to the photosensitive front surface of LLL image pickup device 28. Beam splitter assembly 58 also includes a lens 78 for focusing the pair of laterally separated images

Art Unit: 2878

onto the LLL image pickup device 28. Lenses 70 and 78 may be variable focus or zoom type lenses to accommodate endoscopes having field stops of various sizes" which is illustrated in Figs. 2 and 3. Thus an endoscope field stop (60 in Fig. 2) having a pre-determined size defines the lateral size of the image which is focus onto the second image sensor (28 in Fig. 3). Therefore it is clear that Lazarev *et al.* disclose that a fluorescence imaging region on the second image sensor (28 in Fig. 3) have a lateral size defined by the endoscope field stop which is within the area of the filter (30 in Fig. 3) since the laterally spaced image pass through the filter (30 in Fig. 3). It should also be noted that regions other than the fluorescence imaging region can be denoted as non-imaging regions.

In response to applicant's argument (second paragraph on pg. 9 of remarks filed 14 August 2002) that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (*i.e.*, areas outside the region of interest are not formed as image forming areas) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicant should note that independent claims 3 and 4 recite the limitation of "a non-imaging region other than the fluorescence imaging region".

Applicant argues (first two paragraphs on pg. 10 of remarks filed 14 August 2002) that Wilder *et al.* do not teach the prevention of read out of pixels in non-imaging areas. Examiner respectfully disagrees. Wilder *et al.* state (column 6, lines 40-44) that "In the Multiple Region of Interest (MRI) mode, any region or regions of the image sensor 10 may be selected and the pixels within that region may be scanned in any of the variable

resolution modes discussed above", (column 17, lines 64-66) that "For example, if the pattern of pixel readings in use excludes certain pixels, those pixels will remain unread for an essentially infinite time", and (column 18, lines 7-12) that "Alternatively, the pattern may be selected so that every pixel is read, even when the data from some pixels is not required. Where only some pixels are of interest, the unimportant pixels may be read out as parts of large superpixels. Thus, the time consumed in reading unimportant pixels is minimal". Thus Wilder *et al.* teach multiple regions of interest with each region having a resolution that can be independent of other regions of interest and that all pixels can be read or alternatively some pixels are unread (*i.e.*, prevented from being read). Wilder *et al.* also teach that unimportant pixels can be prevented from being read or read out as parts of large superpixels (*i.e.*, binning reading) in order minimize the time consumed in reading unimportant pixels. Therefore it would have been obvious to one having ordinary skill in the art that unimportant pixels (*e.g.*, pixels in region other than the fluorescence imaging region) in the fluorescence imaging apparatus of Lazarev *et al.* can be at least one of (a) prevented from being read and (b) read out as parts of large superpixels, in order to minimize the time consumed in reading unimportant pixels as taught by Wilder *et al.*

In response to applicant's arguments (last paragraph on pg. 10 of remarks filed 14 August 2002) against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Moreover, examiner respectfully disagrees with applicant contention that Lazarev *et al.* do not teach an off-center fluorescent imaging region. As discussed above, Lazarev *et al.* disclose that a

Art Unit: 2878

fluorescence imaging region on the second image sensor (28 in Fig. 3) have a lateral size defined by the endoscope field stop which is within the area of the filter (e.g., 30 in Fig. 3).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 5,369,525 (Bala *et al.*) provides background information on endoscope field stops.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (703) 308-4860. The examiner can normally be reached on Tuesday-Thursday.

Art Unit: 2878

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (703) 308-4852. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

SL
January 13, 2003


DAVID PORTA
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800